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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,446	07/11/2006	Toshiki Origuchi	3273-0225PUS1	2164

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EXAMINER

SALVITTI, MICHAEL A

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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05/15/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/581,446	Applicant(s) ORIGUCHI ET AL.	
	Examiner MICHAEL A. SALVITTI	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

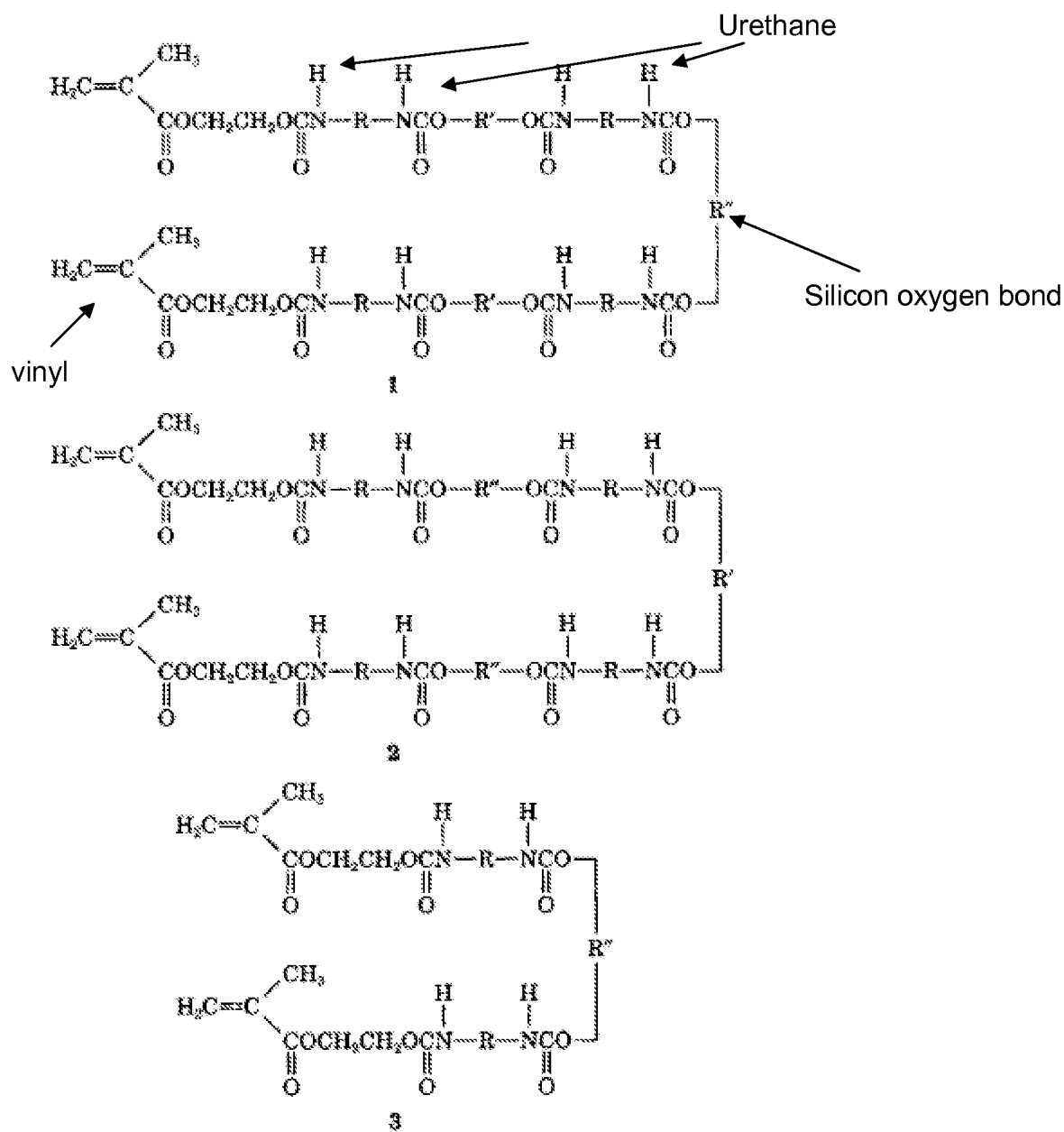
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by *Lai*, “Novel Polyurethane-Silicone Hydrogels” Journal of Applied Polymer Science 56, 301-310 (1995).

Regarding claim 1: *Lai* teaches a vinyl-urethane copolymer comprising at least one vinyl polymer chain and at least one urethane polymer chain (see page 302, right hand column, and attached diagram). Upon initiating polymerization of the acrylate (page 303, “Hydrogel Synthesis”) a vinyl polymer chain is connected to the urethane chain via a silicon-oxygen bond (R”). The vinyl and urethane chains are indirectly connected via the silicon-oxygen bond, however, this interpretation is derived using the broadest reasonable interpretation (see diagram on the next page).

Regarding claim 3: *Lai* teaches a vinyl-urethane copolymer of claim 1, wherein the linkage segment is a silicone polymer chain ((SiO)_n page 302, right hand column).

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Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by WO/03018658 to *Schindler et al.* The English equivalent of this document, US 2004/0204539 will be used for citation purposes.

Regarding claim 1: *Schindler* teaches a vinyl-urethane copolymer comprising at least one vinyl polymer chain and at least one urethane polymer chain (see Examples 7 and 8, ¶ [0089]-[0092]). The silicon-oxygen bond between the polymers is stated to form upon exposure to moisture (¶ [0055]) and/or catalysts (¶ [0056]).

Regarding claim 2: *Schindler* teaches first the synthesis of a urethane polymer having at least one silicon-containing hydrolysable group (¶ [0089]-[0090]). This compound is then reacted with a silylated vinyl polymer (vinyltrimethoxysilane; ¶ [0091]). The vinyl trimethoxysilane meets both “B” and “C”.

Regarding claim 3: Upon condensation of the vinyl and urethane silanes via moisture or catalyst (¶ [0055]-[0056]), a silicone polymer chain forms, given the broadest reasonable interpretation of two siloxane units constituting a polymer. In the alternative, polymethylsiloxane is incorporated into the reaction (¶ [0087]).

Regarding claim 4: Claim 4 is a product-by-process. “Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established.” *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). See MPEP § 2112.01. A silicon-containing hydrolysable group of a urethane polymer (reaction of isocyanatomethoxysilane with

propylene glycol; ¶ [0089]) with a vinyltrimethylsilane (¶ [0091]; both “C” and “D”), leads to the product claimed by the instant claim.

Regarding claim 5: *Schindler* teaches the vinyl-urethane copolymer of claim 2, wherein the at least one silicon-containing hydrolyzable group is an alkoxysilylated urethane polymer (¶ [0089]). A hydrolyzable group is present at the terminus of the polymer, as evidenced by the excess of silylated diisocyanate used. The urethane group of the polyurethane is a hydrophilic group.

Regarding claim 6: *Schindler* teaches the vinyl-urethane copolymer of claim 5, with at least part of the terminal isocyanate groups being alkoxysilylated, as evidenced by the excess of silylated diisocyanate present (¶ [0089]).

Regarding claim 7: Claim 7 is a product-by-process. “Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established.” *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). See MPEP § 2112.01. *Schindler* teaches the alkoxysilylated urethane polymer having terminal alkoxysilyl group (as evidenced by the excess of silylated diisocyanate ¶ [0089]). The compound contains at least one hydrophilic group and plural isocyanate reactive groups (isocyanatomethyl-trimethoxysilane; ¶ [0089]). This compound is a polyisocyanate and an alkoxysilane compound.

Regarding claim 8: *Schindler* teaches a silane compound having silicon-containing hydrolyzable group as an alkoxy group-containing silane compound (trimethylsilyl-terminated polydimethylsiloxane; ¶ [0087]).

Regarding claim 9: *Schindler* teaches copolymerizations with unsaturated monomers such as (meth)acryloyloxymethyl-trimethoxysilane (¶ [0030]). In this interpretation, B and C of instant claim 2 have been considered to meet both limitations.

Regarding claim 10: *Schindler* teaches (meth)acryloyloxymethyl-trimethoxysilane (¶ [0030]), a hydrolysable silicon-containing ethylenically unsaturated monomer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO/03018658 to *Schindler et al.* in view of U.S. Patent No. 6,031,041 to *Chung et al.*

Regarding claim 11: *Schindler* teaches a method for producing a vinyl-urethane copolymer comprising at least one vinyl polymer chain and at least one urethane polymer chain, the vinyl polymer chain being combined with the urethane polymer chain through the intermediary of a linkage segment having a silicon oxygen bond (Examples

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5 and 6). The method comprises preparing a dispersion of urethane with at least one silicon-containing hydrolysable group (Example 7) and adding a silylated vinyl to the mixture (Example 8), followed by curing (§ [0092]).

Schindler is silent regarding the reaction occurring in aqueous solution. *Chung* teaches a method wherein a silylated vinyl monomer is polymerized in the presence of an aqueous polyurethane dispersion (see Examples 4 and 5, col. 7 of *Chung*). These references are analogous art, in that they are drawn to the same field of endeavor, namely preparation of silylated vinyl-urethane copolymers suitable as coatings. At the time of the invention, it would have been obvious to a person having ordinary skill in the art to prepare the composition taught by *Schindler* in aqueous solution, with the motivation of providing a water-borne coating which avoid the use of organic solvents (*Chung* col. 1, lines 15-25), which are desirable from an economic and environmental standpoint.

Regarding claim 12: *Schindler* is silent regarding a method of preparing these coatings in an aqueous environment, as set forth by claim 12. *Chung* teaches a method of preparing aqueous coatings wherein urethane polymers are prepared in an aqueous solution, followed by subsequent (analogous to step Y1-b of claim 12) polymerization of ethylenically unsaturated monomers, including a silyl-containing unsaturated monomer (see Examples 4-5, col. 7 of *Chung*). At the time of the invention, it would have been obvious to a person having ordinary skill in the art to prepare the reaction in aqueous solution, with the motivation of providing a water-borne coating which avoid the use of

organic solvents (*Chung* col. 1, lines 15-25), which are desirable from an economic and environmental standpoint.

Regarding claim 13: *Schindler* is silent regarding a method of preparing these coatings in an aqueous environment, as set forth by claim 13. *Chung* teaches a method of preparing aqueous coatings wherein urethane polymers are prepared in an aqueous solution, followed by subsequent polymerization of ethylenically unsaturated monomers, including a silyl-containing unsaturated monomer (see Examples 4-5, col. 7 of *Chung*). At the time of the invention, it would have been obvious to a person having ordinary skill in the art to prepare the reaction in aqueous solution, with the motivation of providing a water-borne coating which avoid the use of organic solvents (*Chung* col. 1, lines 15-25), which are desirable from an economic and environmental standpoint.

Regarding claim 14: *Schindler* teaches a silane compound which contains at least one functional group reactive with an ethylenically unsaturated monomer (§ [0030]).

Regarding claim 16: *Schindler* teaches a silicon-containing hydrolyzable group urethane polymer as an alkoxysilated urethane polymer (the carbamate of the urethane polymer has been interpreted as being hydrophilic).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Schindler* in view of *Chung* as applied to claim 11 above, and further in view of U.S. Patent No. 5,854,332 to *Swarup et al.*

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Schindler in view of *Chung* suggests the obviousness of preparing composition of claim 11 by means of aqueous polymerization.

Schindler is silent regarding preparation of the composition by polymerizing using ethylenically unsaturated monomer as the solvent. *Swarup* teaches a method of preparing a urethane polymer in ethylenically unsaturated solvent (see Example I, col. 12), followed by addition of water (Example XI, col. 16). These references are analogous art in that they are drawn to the same field of endeavor, namely synthesis of polyurethane/polyvinyl polymers used in coating applications. At the time of the invention, it would have been obvious to a person having ordinary skill in the art to prepare the polymer of *Schindler* by the method of *Swarup* to create an polyurethane/polyvinyl hybrid aqueous coating, avoiding the use of organic solvents, leading to a better product.

Response to Arguments

Applicant's arguments, see "Remarks" pages 11-16, filed 1/29/2009, with respect to the rejection(s) of claim(s) 1-16 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of *Lai*, *Morita*, *Chung*, *Swarup* and *Schindler*.

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- JP 2004-035590
- JP 2003-238795
- JP 2004-182934

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. SALVITTI whose telephone number is (571)270-7341. The examiner can normally be reached on Monday-Thursday 8AM-7PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1796

/M. A. S./
Examiner, Art Unit 1796